CHARGE NUMBER: 1804
PROGRAM TITLE: CO_2 Expansion
PERIOD COVERED: April 1 - 30, 1980
PROJECT LEADER: R. G. Uhl

I. TOWER STUDIES

The second round of tower gas velocity experiments was completed (four gas velocities, each at three temperatures). This was to determine the effect of gas velocity on CV/OV relationships, chemical losses and breakage as well as to assist in the design of improved tower configurations. Analytical results are pending.

Sixteen batches were expanded for the aged tobacco study (age = 2 months). Analysis of this data and comparison with the zero time and one-month samples show that the increase in CV due to expansion has been changing with tobacco age when comparing equilibrated tower exit CVs to feedstock values. The Δ CV of the thin grade tobacco is decreasing by 3 CV units/month while the bodied tobacco Δ CV is increasing 1 CV unit/month. Equilibrated cylinder exit CVs are holding steady at 84 cc/10g for the thin grade and 68 cc/10g for the bodied, resulting in Δ CVs of 51 and 39 units respectively on a reordered basis.

The Marlboro blend cigarettes containing pilot plant expanded Trinity ripper shorts (15% in DBC bright) were remade to resolve subjective discrepancies not detectable in the cigarettes made from 100% expanded material.

Sieve analysis of spot samples from the pilot and MC DIET plants shows identical % longs being fed to both towers. However, most pilot plant breakage appears to be taking place after the clump breaker (in the Vibrabin and conveyor system) while almost all MC breakage appears attributable to the clump breaker. These effects also hold for analysis on a longs + mediums basis. More extensive sampling is planned at both locations to verify this spot analysis.

Westab impregnated ET was expanded in the 8" tower to determine the effects of increased gas temperature in a tangential system. Runs were made at 550, 565, 600 and 615°F in that order. There was a short delay between the 600° and 615°F runs. Temperature was re-established gradually; nevertheless, the tobacco ignited at 615°F. Tower exit OVs were higher than expected, ranging from 4-5% at the lower temperature to 3.8% OV at 600°F and 2.7% OV at 615°F. Pilot impregnated material normally runs 3.8 - 4.0% OV at 540°F. Reordered equilibrated CV was 11 units better for the 600°F sample (CV/OV = 82.5/11.4). (No. 615°F CV sample was taken due to sparks.)

II. REORDERING STUDIES

Pilot DIET was reordered by mixing the tower exit material (≈2% OV) with a like weight of unexpanded feed material (20% OV). This eliminates water spraying for reordering and eliminates roaster drying for part of the unexpanded bright blend. Analytical results are pending.

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III. ALKALOID RECOVERY

Alkaloid level in the wet scrubber liquor leveled out at just above 0.1%. Fresh water input and gas stream leaks have been eliminated to determine the maximum alkaloid concentration attainable in a total recycle system. Recovery of nicotine from the scrubber water via ion exchange resin appears to be the only viable recovery route with these extremely dilute solutions. Ammonia level in the liquor is 50 times greater with the ET process. This would necessitate NH_3 removal for ion exchange recovery since it competes with nicotine for resin sites. Higher scrubber water alkaloid concentrations could make other recovery techniques (e.g. organic phase separation) feasible.

IV. MISCELLANEOUS

The K-Ray unit has been relocated to the top of the impregnator. Circuitry repairs are in progress.

Demonstration runs were conducted for PM and Airco attorneys in reference to the DIET patent litigation.

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